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NORTH AMERICAN PIPERS OF THE SECTION OTTONIA¹

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The woody Piperaceae, with 2-5 unfimbriate stigmas, comprise the better part of 1,000 species, the extremes of which differ greatly while the segregation of those that are closely related is very difficult. The structure and numerical plan of the minute flowers run over so large a range of differences that it seems quite unreasonable to include them all in a single genus; but however the lines be drawn, the segregates remain too heterogeneous and laxly characterized to give satisfaction. Even as subgenera or sections of the single genus *Piper*, this is true of them.

When Casimir de Candolle monographed the family, half a century ago, he admitted several such subdivisions of *Piper* (1), and with various emendations these are kept up in most of his publications during the two generations through which he has been accorded by common consent the title of master in this field. Shortly before his death, however, in a manuscript (2) on the Central American representatives of the genus, his expressed views on this point underwent modification to the extent of assigning to a distinct section, *Ottonia*, the species with pedicellate flowers which he had placed formerly partly in the section *Enckea* and partly in the section *Steffensia*. This section corresponds to Sprengel's genus *Ottonia*, of 1820; the type of which is the South American *Piper Jaborandi*.

Though M. de Candolle monographed the West Indian Piperaceae (3) eighteen years ago and subsequently added descriptions of occasional novelties, and made a reexamination of the Isthmian and Central American species of *Piper* when preparing the manuscript of which parts have been published within the past year (4), no effort has been made to consider the Mexican species collectively since Hemsley included them in his tabulation of the Central American flora nearly forty years ago. Indeed, in the whole large genus, only two Mexican species (5) have been described during the past generation.

Among a considerable number of undetermined Pipers at the New York Botanical Garden and in the United States National Herbarium, which Dr. Britton and Mr. Maxon have permitted me to study preliminary to a general revision of the North American representatives of the family, several interesting Mexican novelties in the pedicellate section *Ottonia* occur. The analysis of these which follows may serve to illustrate the

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statement made earlier, that however simply a section may be conceived, in Piper, it is certain to prove heterogeneous in what are regarded ordinarily as significant floral characters.

As here construed, excluding the Javan *Piper Zippelia*, the Ottonias are exclusively American. Two thirds of their number occur in South America; and one appears to be limited to the continental island Trinidad. Of the others, eight are Mexican: one in the lowlands of Yucatan, two in the Eastern Sierra Madre and Cordillera, and five in the Western Sierra Madre. One species is Honduranian, and one Nicaraguan.

Except for the Trinidad species, which, like those of continental South America, has pinnately veined leaves, all of these have palmately nerved foliage. In contrast with those of the eastern slope, which have elongated, rather lance-ovate leaves, those of western Mexico bear round-ovate, often shallowly cordate-truncate leaves.

In the diagnostic stalking of their flowers they present a gradation from the close-set, nearly sessile flowers of *P. brachypus* to those with a pedicel distinctly longer than the flower.

Characteristically hypogynous, the stamens in two species are adnate to the ovary for a considerable distance; in this respect paralleling the sessile-flowered Pipers, some of which are quite hypogynous while others have epigynous stamens. In one of the Ottonias, *P. abalienatum*, the stamens form two separated alternating whorls around the ovary.

Though the stigmas are essentially sessile on the ovary in species like *P. Muelleri* and the epigynous *P. albicaule*, the fruiting ovary is attenuate into something of a beak in the former; and *P. abalienatum*, even when in flower, possesses a columnar style essentially as long as the ovary. Perhaps the most interesting species in this respect is *P. brachypus*, in which a very short, thick style matures into a stylopodial disk which caps the fruit and is comparable with that of the sessile-flowered *P. smilacifolium*—one form of which was segregated formerly under the name *P. discophorum*.

CONSPECTUS OF THE NORTH AMERICAN OTTONIAS

Leaves pinnately nerved.	<i>Piper ovatum.</i>
Leaves palmately nerved.	
Leaves distinctly longer than broad.	
Leaves somewhat pubescent beneath.	<i>P. Muelleri.</i>
Leaves and petioles glabrous or barely puberulous.	
Leaves broadly ovate.	<i>P. yucatanense.</i>
Leaves lance-ovate: spikes rather short.	
Leaves acute and minutely subauriculate at base.	<i>P. Neesianum.</i>
Leaves rounded at base.	
Spikes scarcely 20 mm. long.	<i>P. Thiemeanum.</i>
Spikes 25–30 mm. long.	<i>P. Tatei.</i>
Leaves about as broad as long.	
Pedicels very short.	<i>P. brachypus.</i>
Pedicels very evident.	

Stamens hypogynous.

Leaves glabrate.

Spike not longer than leaf.

Spike distinctly longer.

Leaves puberulent; spike elongated.

Stamens adnate to ovary; leaves pubescent.

Style very prominent.

Style nearly suppressed.

P. Digueianum.

P. Mas.

P. Rosei.

P. abalienatum.

P. albicaule.

Piper ovatum Vahl, Eclog. 3. Pl. 1. 1796.—C.DC., Prod. 16¹: 253, and Urban, Symbolae Antillanae 3: 174.

Glabrous; leaves ovate-elliptic, acuminate, narrowed and nearly equally cordulate at base, moderately small (5–6.5 × 12–14 cm.), pinnately nerved throughout, the nerves 10 or 12 × 2; petiole short (10 mm.); spikes moderately short (50 mm.); peduncle equaling the petiole; bracts concave; flowers short-pedicel, perfect, hypogynous, 4-androus; ovary with a short style; stigmas 4; berries ovoid-attenuate.

Trinidad, West Indies (*Ryan*, the type; *Purdie*; *Fendler* 669; not known to be represented in North American herbaria).

Piper Muellieri C.DC., Prod. 16¹: 243. 1869.

More or less soft-pubescent; leaves elliptic-ovate, acuminate, rounded at base, small (scarcely 5 × 12 cm.), palmately 5- or 7-nerved, bullate in age; petiole short (5–10 mm.); spikes moderately short (50 mm.); peduncle exceeding the petiole (15 mm.); bracts concave; flowers pedicellate with the pedicels unequally long up to 1.5 mm., perfect, 6-androus, with hypogynous anthers rather shorter than the filaments; stigmas 3, sessile; berries round-ovoid, apiculate.—Plate V, figure 1.

Eastern Sierra Madre, Mexico, about Orizaba (*Mueller* 180, the type; *Botteri* 1156).

Piper yucatanense C.DC., Linnaea 37: 334. "1871–3."

Closely resembling *P. Muellieri* but glabrous throughout, the subsessile leaves ovate and measuring 6.5 × 12 cm.

Yucatan, Mexico (*Linden* 184; not known to be represented in American herbaria.)

Piper Neesianum C.DC., Prod. 16¹: 256. 1869.

Glabrous except that the leaves are minutely puberulous beneath; leaves lance-elliptic, long-acuminate, acute and minutely unguiculate-auriculate at base, small (scarcely 4 × 10 cm.), palmately 5-nerved; petiole moderate (10 mm.); spikes very short (scarcely 20 mm.); peduncle half as long as the spike; bracts evanescent; flowers pedicellate with the pedicels scarcely over 1 mm. long, 3- to 6-androus, hypogynous; ovary ovoid or oblong-ovoid; stigmas 3, sessile.—Plate VII, figure 1.

Eastern Sierra Madre, Mexico (without indicated locality, *Karwinski* 823, the type); Papantla (*Liebmann* 18); Orizaba (*Botteri* 192). Also reported from Nicaragua (*Tate* 367).

Piper Thiemeanum n. sp.

Glabrous; leaves ovate-lanceolate, long-acuminate, rounded at base,

small ($2-4 \times 8.5-13$ cm.), palmately 5-nerved; petiole very short (3 mm.); spikes very short (scarcely 20 mm.); peduncle nearly half as long as the spike; bracts spatulate; flowers pedicellate with the pedicels unequally long up to 2 mm., 5-androus with large sessile hypogynous anthers; ovary conical-ovoid, somewhat constricted at apex; stigmas 3.—Plate V, figure 2.

Northern Honduras, about San Pedro Sula (*Thieme 5455*, the type).

Piper Tatei n. sp.

Piper Neesianum Auct., as to Nicaragua.

General characters of *P. Thiemeanum* but the leaves minutely puberulous beneath and the spikes one-half longer (25–30 mm.).

Nicaragua, presumably from Chontales (*Tate 367*, 1867–8, the type at Kew).

Piper brachypus n. sp.

Glabrous, or at most puberulent; leaves somewhat obliquely round-ovate, blunt-acuminate, rounded or subtruncate or shallowly cordate at base, in either case with a short deltoid contraction into the petiole, small ($5-6 \times 7-8$ or even 8×9 cm.), palmately about 9-nerved; petiole rather short (5–15 mm.); spikes elongated (80–90 mm.); peduncle short (10–15 mm.); bracts concave, pubescent; flowers short-pedicel with the pedicels scarcely 0.5 mm. long, hypogynous, 5-androus, the filaments very short; ovary somewhat contracted into a short stylopodium; stigmas 3 or 4, sessile; berries round-ovoid, crowned by the rather evident broad stylopodium.—Plate VI.

Western coast region of Mexico, about Manzanillo (*Palmer 1332*, the type).

Piper Rosei C.DC., in herb., n. sp.

Puberulent; leaves somewhat obliquely round-ovate, acuminate, rounded or shallowly cordate at base with a short deltoid contraction into the petiole, small ($6-8 \times 8-10$ cm.), palmately about 7-nerved; petiole rather short (10–15 mm.); spikes elongated (60–90 mm.); peduncle short (5–10 mm.); bracts concave, puberulous; flowers short-pedicel with the pedicels scarcely 1 mm. long, hypogynous, 3- or 4-androus, the filaments shorter than the rather large anthers; ovary ovoid; stigmas 3, sessile.

Western Sierra Madre of Mexico (Colomas, *Rose 3234*, the type, and *1657*).

Piper Diguettianum n. sp.

Transiently puberulous, or glabrous, with the general characters of *P. Rosei* but the spikes shorter (40 mm.), the pedicels reaching a length of 1.5 mm., and the flowers 5-androus.

Western Sierra Madre of Mexico (Jalisco, without other data, *Diguett*, the type).

Piper Mas n. sp.

Rather transiently puberulent; leaves round-ovate, acuminate, truncate-cordate with short deltoid contraction into the petiole, small (5×6 cm.), palmately 7- or obscurely 9-nerved; petiole short (10 mm.); spikes elongated (70–90 mm.); peduncle short (5–15 mm.); bracts concave, glabrate; flowers

short-pedicceled, with the pedicels scarcely 1 mm. long, hypogynous, 5-androus, the filaments shorter than the rather large anthers; ovary minute, ovoid; stigmas 3, sessile.—Plate VII, figure 2.

Western Sierra Madre of Mexico (El Muleto, *Langlassé 215*, the type).

Piper abalienatum n. sp.

Dingy-villous or pubescent throughout, the puberulous older branches pale; leaves round-ovate or subquadrate, short-acuminate, truncately rounded or shallowly truncate-cordate at base, comparatively large (7.5×7.5 – 16×18 cm.), palmately 9- or 11-nerved; petiole rather short (15 mm.); spikes elongated (130 mm.); peduncle rather short (15 mm.); bracts spatulate; flowers rather long-pedicceled, the pedicels up to 2 mm. long, 5- or 6-androus, the short filaments adnate nearly to the middle of the flask-shaped ovary; stigmas 3, on a constricted style nearly as long as the ovary; berries subglobose, surmounted by the stout style.—Plate VIII, figure 1.

Western Sierra Madre of Mexico (Colima, *Palmer 100*, the type).

Piper albicaule n. sp.

More or less persistently gray-tomentose or pubescent throughout, branches for a time silvery from the detaching epidermis; leaves subquadrate-orbicular, rather abruptly long-acuminate, truncate at base, rather small (5.5×7 – 8.5×9 cm.), palmately about 9-nerved; petiole short (10 mm.); spikes elongated (100 mm.); flowers long-pedicellate, the pedicels up to 2 mm. long, 5- or 6-androus, the very short filaments adnate nearly to the middle of the ovoid ovary; stigmas 3, on a conical style half as long as the flowering ovary but becoming obliterated as the subglobose berry enlarges.—Plate VIII, figure 2.

Western Sierra Madre of Mexico (Santa Rosa near Aguila, *Langlassé 248*, the type).

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EXPLANATION OF PLATES

Habit figures are of natural size; flowers or fruit $\times 10$.

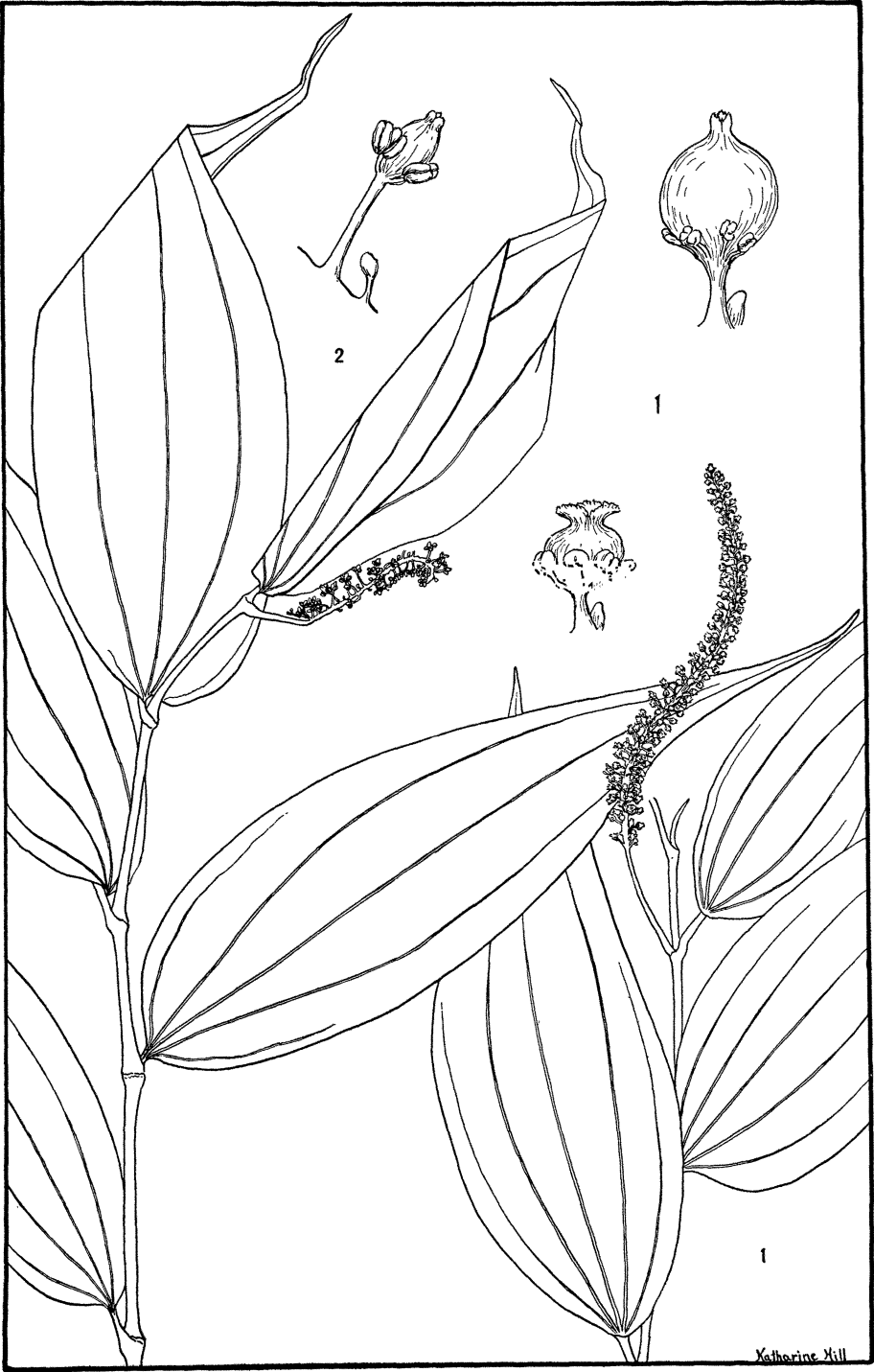
PLATE V

FIG. 1. *Piper Muelleri*, the type collection.

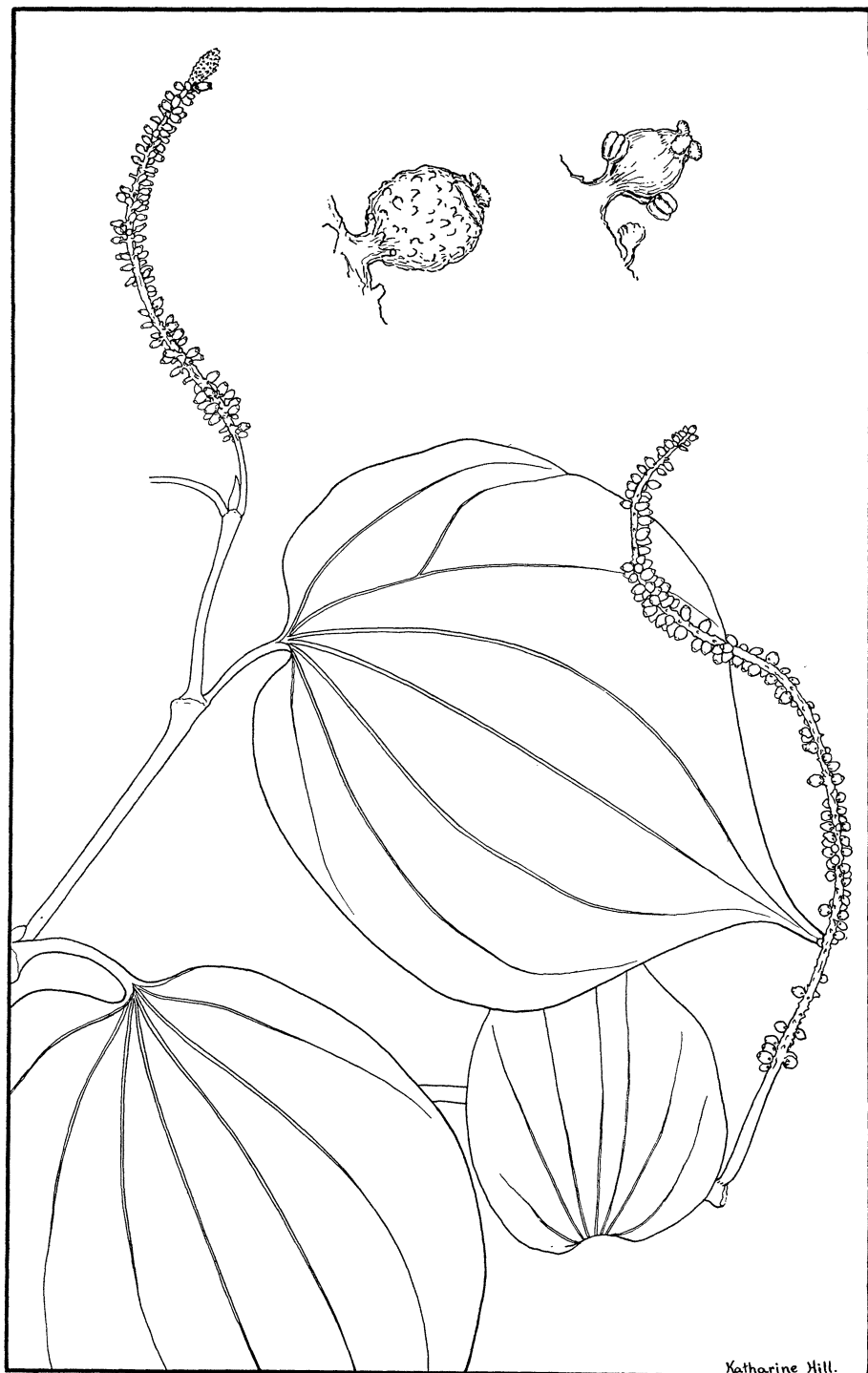
FIG. 2. *Piper Thiemeianum*, the type collection.

PLATE VI

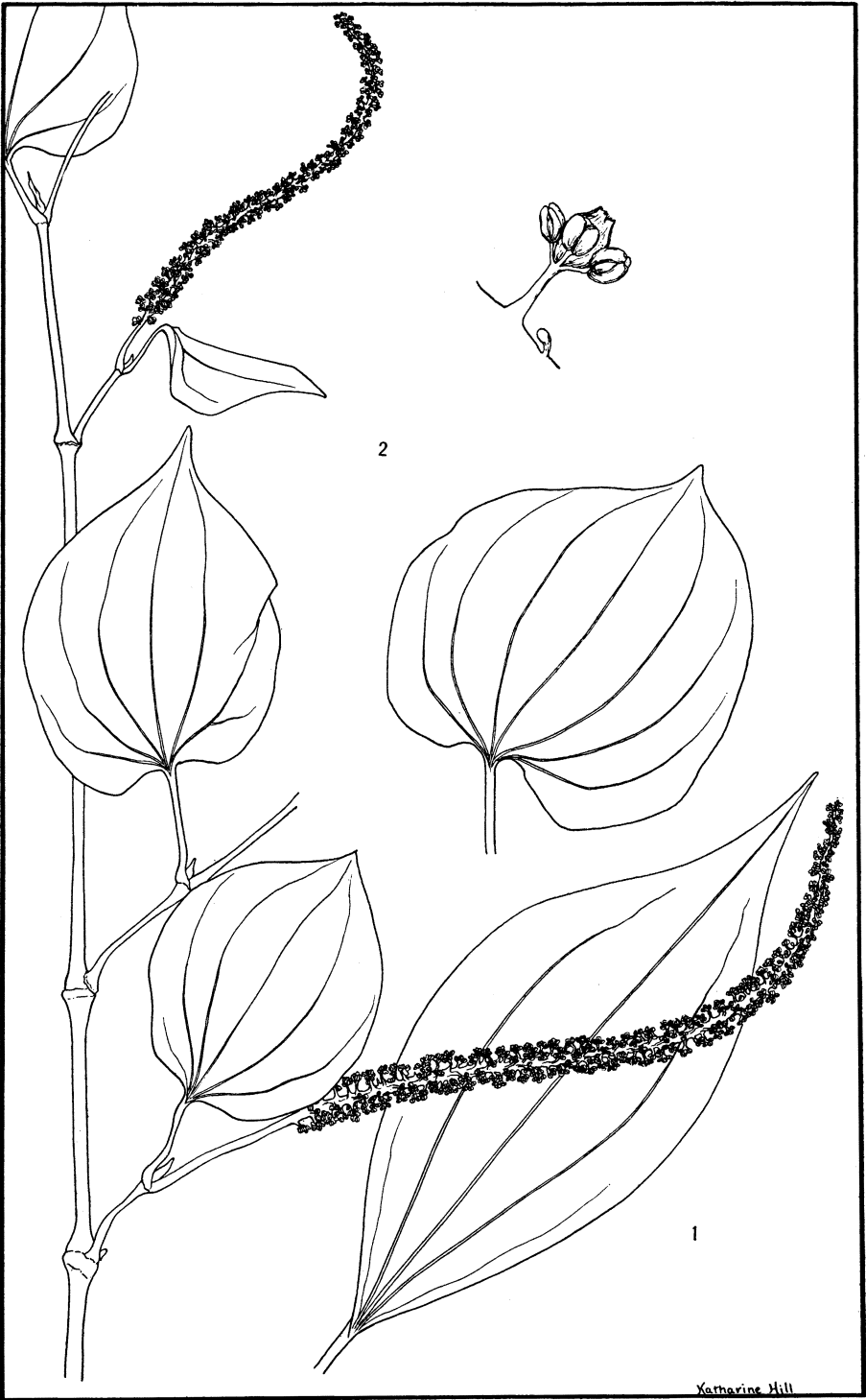
Piper brachypus, the type collection.



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PLATE VII

FIG. 1. *Piper Neesianum* (Liebmann 18).

FIG. 2. *Piper Mas*, the type collection.

PLATE VIII

FIG. 1. *Piper abalienatum*, the type collection.

FIG. 2. *Piper albicaule*, the type collection.